Log Event A

Borehole # 40-04-01

Borehole Information

Farm : S	**Tank :** S-104	**Site Number :** 299-W23-123
N-Coord : 36,161	**W-Coord :** 75,636	**TOC Elevation :** 665.80
Water Level, ft :	**Date Drilled :** 5/31/1970	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:
The borehole was drilled in May and June 1970 and completed to a depth of 100 ft with 6-in.-diameter casing. The driller's log contains no reference to perforations or grout. It is assumed, therefore, that the borehole was not perforated or grouted. The borehole casing thickness is assumed to 0.280 in., on the basis of the published thickness for schedule-40, 6-in.-diameter steel casing.

During the first attempt to drill the borehole, the tools became stuck at a depth of 58 ft; the driller's log does not provide information as to the location of the first drill site. The drill rig was moved to a second site and the well was completed. During the second attempt, the drill struck concrete and asphalt at depths of 42 and 46 ft. The driller's log states that a sample from a depth of 45 ft had a count of 2,000. It is unknown if the activity was measured in counts per second or counts per minute, but it is assumed that this represented anomalously high activity.

The zero reference for the SGLS logs is the top of the casing. The top of the casing is approximately level with the ground surface.

Equipment Information

Logging System : 2	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 05/1996	**Calibration Reference :** GJPO-HAN-5	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number :	1	**Log Run Date :**	06/03/1996	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	98.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	47.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	2	**Log Run Date :**	06/04/1996	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	0.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	48.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Event A

Borehole 40-04-01

Analysis Information

Analyst : D.L. Parker

Data Processing Reference : P-GJPO-1787 Analysis Date : 03/07/1997

Analysis Notes :

The borehole was logged in two log runs with a centralizer used for each log run. The pre- and post-survey field verification spectra met the acceptance criteria established for peak-shape and system efficiency. The energy and peak-shape calibration from the pre- and post-survey field verification spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during log run one. The energy and peak-shape calibration from the post-survey field verification spectra were used to establish the channel-to-energy parameters used in the processing of the spectra acquired during log run two. Casing correction factors for a 0.280-in.-thick casing were applied during the analysis.

A depth overlap, where data were collected at the same depth during both logging runs, occurred from 47 to 48 ft. The concentrations of the naturally occurring radionuclides were calculated using the separate data sets at the overlapping depths. The calculated concentrations within the overlapping depths were within two standard deviations (two sigma or 95-percent confidence interval), indicating the acceptable repeatability of the measurements.

Cs-137 was the only man-made radionuclide encountered in this borehole. Cs-137 contamination was detected continuously from the ground surface to about 24 ft, intermittently from 25.5 to 34.5 ft, nearly continuously from 36 to 51 ft, from 54 to 62.5 ft, and intermittently to the bottom of the borehole. The maximum Cs-137 concentration below the ground surface was 5.5 pCi/g at about 16.5 ft.

The logs of the naturally occurring radionuclides show an increase in K-40 concentrations at about 48 ft.

Details concerning the interpretation of data for this borehole are presented in the Tank Summary Data Report for tank S-104.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The naturally occurring radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the minimum detection limit (MDL). The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes both the man-made and naturally occurring radionuclides, the total-count log plot, as well as the Tank Farm gross-gamma log. The Tank Farm gross-gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma log plot to coincide with the SGLS data.